



**AmDyne<sup>®</sup>**  
Corporation

# **HAZARDOUS MATERIAL MINIMIZATION EFFORTS in PAINTS and COATINGS U.S. ARMY AVIATION and MISSILE COMMAND**

**James Paul Robinson,  
AmDyne Corporation  
600 Blvd South, Suite 301  
Huntsville AL 35802  
(256) 880-5080 Fax (256) 880-5086  
robinson@amdyne.com**

**U.S. ARMY AVIATION AND MISSILE ENVIRONMENTAL TECHNOLOGY TEAM**



# AMCOM Effort

**AmDyne<sup>®</sup>**  
Corporation

- ★ Identify Applicable Aviation and Missile Command (AMCOM) missile system maintenance documentation
- ★ Review documentation by system
- ★ Subdivide identified HMs by functional class and application
- ★ Develop and populate databases
- ★ Evaluate each identified use of material in the weapon system

LETTERS ARMY AMCOM ENVIRONMENTAL TECHNOLOGY TEAM



# Data Evaluation Process

**AmDyne<sup>®</sup>**  
Corporation

- ★ Identify pre- and post maintenance processes
- ★ Identify substrate composition
- ★ Identify alternative materials
  - \* Commercial resources
  - \* Inter and Intra-service research efforts
- ★ Evaluate proposed substitutes
- ★ Recommend and coordinate proposed changes through all approving parties

AFTRADITION OF EXCELLENCE ENVIRONMENTAL TECHNOLOGY TEAM



# Identification of Materials

**AmDyne<sup>®</sup>**  
Corporation

- ★ **Technical Data Package / Maintenance Document Information typically include:**
  - \* Specification data, National Stock Number (NSN) & product name or generic nomenclature
- ★ **Obtain complete MSDS data**
  - \* Search HM Information System (HMIS)
  - \* Search FED-LOG for supplier data
  - \* Contact supplier(s) for up-to-date MSDS information for each product
- ★ **Communicate with maintenance depots to identify what they are currently using**

TRADITION OF EXCELLENCE ENVIRONMENTAL TECHNOLOGY TEAM



# **PATRIOT - Paints/Coatings, Varnishes & CPCs**

***AmDyne***<sup>®</sup>  
Corporation

★ **593 initial entries for paints/coatings,  
varnishes & Corrosion Prevention  
Compounds**

✱ Additional requirements identified from TDP drawings

★ **5 Missile Interim Specifications (MIS)**

★ **25 Military Specifications, 1 Commercial Item  
Description**

★ **107 primary or alternate NSN**

U.S. ARMY/AMC/OM/ENVIRONMENTAL/TECHNOLOGY/EVALUATION



# Hazardous Material Breakdown

**AmDyne<sup>®</sup>**  
Corporation

## ★ Hazardous Solvents

- ✱ Hazardous Air Pollutants / Air Contaminants (HAPs / HACs)
- ✱ Volatile Organic Compound (VOC) content
  - ✱ Toluene and/or Xylene
  - ✱ Methyl Ethyl Ketone and/or Methyl Isobutyl Ketone (MEK/MIBK)

## ★ Hazardous Metals

- ✱ Chromium, Cadmium, Cobalt, Lead, Beryllium

AMDYNE CORPORATION ENVIRONMENTAL TECHNOLOGY DEPARTMENT



# Hazardous Material Breakdown

(continued)

**AmDyne®**  
Corporation

## ★ RCRA Characteristics

- \* Flashpoint
- \* pH
- \* Disposal requirements

## ★ OSHA - Issues

- \* Severe reduction in exposure levels for chromium and cadmium
- \* Additional safety and health and personal protective equipment (PPE) requirements for continued use

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY



# Patriot Coating Materials

***AmDyne***<sup>®</sup>  
Corporation

- ★ Conversion Coatings
- ★ Pre-primers
- ★ Primers
- ★ Topcoat

AMERICAN MILITARY ENVIRONMENTAL TECHNOLOGY





# Chromate Conversion Coating (CCC)

**AmDyne<sup>®</sup>**  
Corporation

- ★ **MIL-C-5541 Class 1A or 3: Conversion Coating**
  - \* Hexavalent chromium primary constituent
  - \* Used on all aluminum components
- ★ **Alternative Process for Aluminum Armored Vehicles**
  - \* Test program coordinated by TACOM - anticipated completion Sep 99
  - \* Developed and tested at Red River Army Depot
    - \* Profile surface - 2-4 mil with garnet blast & Prime
    - \* Approved for Bradley Family of Vehicles

THE ARMY ENVIRONMENTAL TECHNOLOGY CENTER



# Acid Wash Pre-Primer

**AmDyne<sup>®</sup>**  
Corporation

## ★ DoD-P-15328: Acid Wash Pre-Primer Specification

- \* Contains phosphoric acid and chromates,
  - \* 2-component, solvent based
- \* Low pH and low flashpoint

## ★ 3 alternatives under test at the Army Research Lab (ARL)

- \* Compatibility with current primers & topcoats
- ★ Other non-traditional coating systems
  - \* Polyanilines and Sol-Gels



# Primers

**AmDyne<sup>®</sup>**  
Corporation

## ★ 3 Specifications

- \* MIL-P-23377: high VOC, solvent based, chromates
- \* MIL-P-53022: low VOC solvent based, no chromates
  - \* Used at depots in place of MIL-P-23377
- \* MIL-P-53030: water reducible, no chromates

★ Ultimately the selection of which primer to use is up to Project Office

AMERICAN AIR FORCE ENVIRONMENTAL TECHNOLOGY CENTER



# Chemical Agent Resistant Coating (CARC)

**AmDyne<sup>®</sup>**  
Corporation

## ★ 3 specifications

- \* MIL-C-46168: 2-component , solvent based, high VOC
- \* MIL-C-53039: single component, solvent based, lower VOC
- \* MIL-P-64159: water-reducible, new specification

## ★ Ultimately the selection of which CARC to use is up to Project Office

- \* MIL-P-64159 will be an option on Bradley

## ★ Efforts underway to test and approve powder coat CARC for interior surfaces